

What is claimed is

1 1. A color separation beam splitter for projectors comprising
2 a plurality of prisms connected with each other and three
3 optical interference filters having different wavelength
4 ranges respectively formed on side surfaces of the plurality
5 of prisms, wherein the color separation beam splitter is
6 characterized in that the three optical interference filters
7 include a yellow color reflective dichroic mirror which
8 reflects pure yellow light and passes red light, blue light
9 and green light; a red color reflective dichroic mirror which
10 reflects pure red light and passes green light and blue light;
11 and a blue color reflective dichroic mirror which reflects
12 pure blue light and passes pure green light, so that when a
13 white light is incident to the color separation beam splitter,
14 a yellow light is first reflected by the yellow color
15 reflective dichroic mirror, a red light is then reflected by
16 the red color reflective dichroic mirror, and then a blue
17 light and a green light are split by the blue color reflective
18 dichroic mirror.

1 2. The color separation beam splitter as claimed in claim 1,
2 wherein the plurality of prisms includes two triangular
3 prisms having dichroic beam-splitting coatings formed on side
4 surfaces corresponded to base angles of the triangular prisms;
5 and four right-angled prisms having emerging surfaces which
6 are perpendicular to lights emitted therefrom, in which a
7 multi-layer thin film, which reflects yellow light, is formed
8 on an incident surface of one of the right-angled prisms where
9 an incident white light passes through.

1 3. The color separation beam splitter as claimed in claim 1
2 wherein the plurality of prisms include three right-angled
3 trapezoid prisms having optical interference thin films
4 respectively formed on the surfaces corresponding to two
5 right-angles of the right-angled trapezoid prisms; and two
6 right-angled prisms having emerging surfaces which are
7 perpendicular to lights emitted therefrom.

1 4. The color separation beam splitter as claimed in claim 1
2 wherein the plurality of prisms include three right-angled
3 trapezoid prisms having optical interference thin films
4 respectively formed on the surfaces of the right-angled
5 trapezoid prisms corresponding to two right-angles of the
6 right-angled trapezoid prisms so that a red light can be
7 reflected twice by the optical interference thin films; a
8 multi-layer thin film reflecting yellow light formed on the
9 incident surface of one of the right-angled trapezoid prisms
10 where an incident white light is input; a triangular prism
11 having an optical interference thin film formed on the surface
12 corresponding to a base angle of the triangular prism so that
13 a blue light is reflected twice by the optical interference
14 thin film of the right-angled trapezoid prisms and the optical
15 interference thin film of the triangular prism; and a
16 right-angled, triangular prism for making a light
17 perpendicular to an emerging surface thereof where the light
18 is emitted from.

1 5. The color separation beam splitter as claimed in claim 1
2 wherein the yellow color reflective dichroic mirror is a
3 multi-layer film including periodic layers of Al_2O_3 and SiO_2 .

1 6. The color separation beam splitter as claimed in claim 1
2 wherein both the red color reflective dichroic mirror and the
3 blue color reflective dichroic mirror are multi-layer films
4 including periodic layers of TiO₂ and SiO₂.

1 7. The color separation beam splitter as claimed in claim 4
2 wherein the red light, the blue light and the green light
3 emitted from the prisms are transmitted along a direction
4 parallel to the incident white light.

1 8. A projector comprising a color separation beam splitter
2 of claim 4 for providing lights of three primary colors; three
3 pieces of liquid crystal light valves having the lights of
4 three primary colors passing therethrough, respectively;
5 three dichroic mirrors for receiving the lights of three
6 primary colors output from the liquid crystal light valves
7 and then transmitting the lights of three primary colors along
8 a same direction; an objective lens for receiving and
9 projecting the lights of three primary colors.